

**White Paper written for  
World Batch Forum  
June 2004**



**900 Fox Valley Drive, Suite 204  
Longwood, FL 32779-2552, USA**

**Phone: +1 (407) 774-5764**

**Fax +1 (407) 774-6751**

**E-mail: [info@wbf.org](mailto:info@wbf.org)**

**[www.wbf.org](http://www.wbf.org)**

## **White Paper S88 for End Users**

**Lynn W. Craig  
Sr. Consultant**

**Manufacturing Automation Associates, Inc.  
10 Strafford Circle Road  
Medford, NJ 08055  
USA**

So you are going to get a new batch control system or an improvement of the one you have. If you are going to design and install it yourself, you probably already know a lot about the S88 batch control standard – how it makes design easier and saves lots of time and money. However, if you are going to get someone else to do the design and installation you may feel like you don't really need to know a lot about a dreary sounding standard. In this white paper, we will try to explain briefly why that standard is still very important to you.

It is not all that hard to learn the basics of the standard. It comes in three parts, but if you are not going to design and install a system, part one is all you need to consider. It is not very long. The printed version is only 3/16 of an inch thick, some of which is boilerplate language that only clutters up the standard and no one needs to read. It would be surprising if a careful read took more than three or four hours. It might also be worthwhile to attend a short course or a conference that focuses on the standard. Of course you are probably asking: why go to all that trouble? There are many reasons. Read on, there is only another page to go.

The standard defines three things that should be very important to you. It describes a structure that can be applied to almost any process, terminology to use to describe the process so others can understand what you want and the general function typical of each of the modules that make up the structure. Taken together, the three concepts provide a way to clearly describe how you want the process to work with the new control system. Equally important, it provides a checklist of sorts so that all of the details are covered when you define what you want. Since the definition is focused on small bits, or modules, of the process, at the end of the day it is much easier to determine if you really got what you wanted. The implementation code and the definition of function are tied to the same relatively small module. The standard is a very important link tying your understanding of the process and operational

requirements to the technical know how of the programming wizards who need to make the new system work like you want it to work.

The control system will define how the process will run and how it will be operated. Defining how the process should run is important, but defining how people will interact with the new system is vital. Whether we like it or not, a batch control system goes a long way toward defining the operator's jobs. That is not something you want a third party defining in a vacuum. The way to avoid problems in the design and installation and, more important, to avoid problems after installation is to make sure the system is defined properly and precisely before the first line of computer code or configuration is considered. One of the most important steps in creating a new control system is the functional specification. Often overlooked, it defines all of the modules that make up the process and describe in clear terms exactly *what* each module will do. The "what" is of maximum importance. Unless the person(s) putting the control system together know exactly and unequivocally what each module must do and how they work together, there is no way they can properly define how to make that functionality happen. What you will get is their best guess about what they think you wanted. That is kind of scary.

The standard provides a structure that allows you to subdivide the process into three kinds of modules. It also gives guidance about what kind of functionality is appropriate for each kind of module. What it really does is provide a way to actually write a clear description of the way the process will run and be operated after the control system is finished. Why is that so hard? Why do I need to learn a bunch of terms and stuff to get that done? Well, the fact is that, without the structure the standard provides, it is almost impossible to write down what you want to happen in the detail needed and still get the overall functionality right. Without standard terminology, there will inevitably be misunderstanding. To be clear and complete, a functional description needs to define details like exactly how a remote control valve will work and, at the same time describe higher level functions like how a reaction should be initiated. Without the concepts of modules and structure, the job is extremely difficult. Using the structure and modular concepts the standard describes, the job is not only doable; it can be done with a minimum of pain.

OK, so maybe I need to know more about this. How do I learn what I need to know and still get all the other things done I do every day? There are three pretty good ways to go at it. There is the standard itself, books about how to use it and conferences that bring together a lot of the people doing what you are doing. All are worthwhile.

The standard (you only need part one) can be purchased from ISA (ISA.org), the organization that sponsored the development of the standard. Technically, it is known as ANSI/ISA88.00.01. The international version is called IEC 61512-1 and is available from the International Electrotechnical Commission ([www.iec.ch](http://www.iec.ch)). It will take three or four hours to read either, but they can be heavy going until you get used to the arcane language style peculiar to standards. ISA also offers the electronic version on a CD that adds several other standards and documents that will be of primary interest to someone actually implementing the system.

There are only two books in print that directly address the definition of batch control. They are listed in the bibliography. Both are good and explain structure and definition along with a lot of information about implementation.

Lastly are conferences. The World Batch Forum runs one in North America and one in Europe every year. These take more time but are worth it if you can manage to get to one. They cover the basics and provide an insight into the way others are approaching automation. Much more important, however is the opportunity to meet and talk with other people facing the same challenges you are. Details about conferences and other services, such as web presentations, can be found on the World Batch Forum web site ([wbf.org](http://wbf.org)).

Good luck! If you don't want to count on luck, it is good to know that you seldom need much luck if you get your control system defined right to begin with.

**Bibliography:**

*Applying S88 Batch Control from a User's Perspective*, Jim Parshall and Larry Lamb, ISA, 2000, LC#99-42402, ISBN: 1-55617-703-8

*S88 Implementation Guide*, Darrin Fleming and Velumani Pillai, McGraw Hill, 1999, LC#98-39559, ISBN 0-07-021697-5